

DEDUCTIONS.

Annuli.—Fifteen observed.

Sun, 8. Three followed by rain, four by wind and rain, one by fine weather.

Moon, 7. Two followed by rain, three by wind, two by wind and rain.

Coronas.—Five observed.

Sun, 1. Followed by rain.

Moon, 4. One followed by rain, three by wind and rain.

Halos (single).—Thirteen observed.

Sun, 11. Three followed by rain, one by rain and fog, two by wind, four by wind and rain, one by fine weather (misty and overcast).

Moon, 2. Both followed by rain.

NOTE.—Corona No. 51 and annulus and halo No. 52 are included amongst the phenomena followed by meteorological disturbances, altho the storm followed later than twenty-four hours; because from the time of the observations there was a visible suspense before the imminent storm.

GENERAL REMARKS.

Altogether, of thirty-one distinct individual displays (the rainbows being neglected), there were—

Followed by rain, 11.

Followed by wind and rain, 11.

Followed by wind alone, 6.

Followed by rain and fog, 1.

Followed by fine weather, 2.

The failures are a halo and an annulus, both of the sun.

The observations of the second quarter confirm the results obtained during the first quarter, both as to the indication of approaching disturbances given by halos, coronas, and annuli, and as to the distinction between the latter and the coronas, together with which they never appear, while they are frequently seen simultaneously with halos.

Despite one failure, the annulus seems the best guide as to the following meteorological conditions. Annuli generally show themselves in perfectly fine weather, the next day being at first without the slightest sign of anything but a glorious day, to end with a veiled sky becoming rapidly overcast and with rising wind and rain. On the other hand, halos and coronas are visible only with a veiled and cloudy sky, when the weather is generally visibly unsettled and becoming rapidly worse.

The diameters of the coronas seem to depend on the kind of clouds; the thicker and the more tightly packed, the smaller the diameter. In some cases, with clouds of various concentration drifting before the moon, the corona produced was elliptical or eccentric, various parts being probably produced by vesicles of water vapor of different sizes, throwing the respective arcs of the corona at various distances from the limb.

Once, while cleaning in the open the object glass of my $3\frac{1}{2}$ -inch telescope, I saw in it a well-defined corona of the sun, tho on looking directly the dazzled eye could not distinguish it. Since then I am able to observe solar coronas with ease, and to take very good measurements of them. On looking in the lens so as to see the sun by reflection, four images are produced, one by each face of the achromatic system. The inner face of the biconvex lens gives too bright an image, but the outer face gives a virtual image of greatly diminished brightness which well shows the coronas when they are present. A large, long-focus lens gives better results than a small, short-focus one. The direct (real) image obtained by projection on a piece of white paper can be used successfully when only the latter kind of lens is available.

The summer hitherto has been very bad, being wet and windy, hence what I think will be an abnormally large harvest of these optical phenomena. I am endeavoring now to establish some correlation between the state of the sky and the

appearance of the phenomena, and the particular type of weather and degree of disturbance corresponding to each. For this a large number of observations must be gathered. I hope that some others may be induced to take up the work and help to elucidate many points which are marked in my observation book with a query. I think psychrometric observations should be useful, more useful than thermometric ones, but as yet I can not undertake them.

PURGING THE LISTS.

A small percentage of our correspondents cause themselves and the Publications Division not a little annoyance by not attending promptly to the "penalty" postal card sent annually, asking each to state whether or not he wishes to continue receiving the MONTHLY WEATHER REVIEW. A standing order requires all mailing lists to be revised annually, and this is accomplished by the postal-card method with the least possible trouble to all concerned.

NOTES ON THE JAMESTOWN TERCENTENNIAL EXPOSITION.

By JAMES H. SPENCER, Observer in charge of U. S. Weather Bureau exhibit.

One of the most creditable exhibits at the Jamestown Exposition was the aeronautical display, made by the Aero Club of America under the able direction of Mr. Israel Ludlow. The exhibit of balloons, dirigible balloons, aeroplanes, kites, models of flying machines, photographs, etc., was very complete and more attractively displayed than at any other exposition I have ever attended. Numerous dirigible balloon flights were accomplished by Mr. Lincoln Beechey and others. Mr. Ludlow upon several occasions attempted experimental flights with his aeroplane; these, however, were unsuccessful, due apparently to a lack of launching facilities. During the exposition Mr. Ludlow and his assistants gave instructive lectures on aeronautics.

The Weather Bureau exhibit at the Jamestown Exposition, tho somewhat less elaborate than at St. Louis and Buffalo, did not differ greatly in character from the exhibits at these two former expositions.¹

Much interest was taken in the Jamestown display, particularly the instrumental portion, which comprised one of the few "live" exhibits in "Government Building A." The Bosch-Omori seismograph displayed by the Weather Bureau was perhaps more frequently inspected by visitors than any other single exhibit in the building. The general desire on the part of visitors to see this instrument reflects the great interest in seismology that has been aroused by the recent severe earthquakes and the reports in the public press of the records obtained by the Weather Bureau.

The Weather Bureau exhibit was arranged in four sections, as follows:

Instrumental.—All the important instruments of the Weather Bureau were shown in this section, many of them in operation.

Aerial.—This section consisted of a Weather Bureau kite and reel and considerable self-recording and other apparatus for use in investigating upper air conditions by means of kites and balloons.

Educational.—On a large glass weather map were charted daily the weather conditions in all sections of the country, as shown by telegraphic reports. In this section were also displayed a large relief map and several smaller maps of the United States, showing the mean annual temperature and the average annual precipitation, sunshine, and other data. A

¹ A detailed description of the Weather Bureau exhibit at the Buffalo Exposition appeared in the Review for June, 1901, (Vol. xxix, p. 259-262 and plates I-IV) and of the St. Louis Exposition in the Review for September, 1904, (Vol. xxxii, p. 411-413.)

meteorological library was maintained, and the various textbooks exhibited were frequently consulted by teachers and others.

Photographs.—A large number of beautiful photographs, showing cloud and fog studies, snow crystals, floods, etc., were attractively displayed.

A model storm-warning tower and four large storm-warning lanterns were among the additional equipment exhibited.

RECENT ADDITIONS TO THE WEATHER BUREAU LIBRARY.

H. H. KIMBALL, Librarian.

The following titles have been selected from among the books recently received, as representing those most likely to be useful to Weather Bureau officials in their meteorological work and studies. Most of them can be loaned for a limited time to officials and employees who make application for them.

Aachen. Meteorologisches Observatorium.

Das neuerbaute meteorologische Observatorium zu Aachen. Karlsruhe. 1901. 21 p. f°.

Hobbs, William Herbert.

Earthquakes, an introduction to seismic geology. New York. 1907. xxx, 336 p. 12°.

Kühl, Wilhelm.

Der jährliche Gang der Bodentemperatur in verschiedenen Klimaten. ... Inaug.-Diss. Berlin. [Würzburg. 1907. 66 p. 8°.]

Mathesius, —.

Die Kayser'schen Wolkenhöhen-Messungen der Jahre 1896 und 1897. Danzig. 1907. p. 49-137. 4°. (S.-A. Schriften. Danzig. N. F. 12 Bd. 1. Heft. Danzig. 1907.)

Platania, Giovanni.

I fenomeni in mare durante il terremoto di Calabria del 1905. Modena. 1907. 41 p. 8°.

Prussia. Königliche preussische aeronautische Observatorium. Lindenbergl.

Ergebnisse der Arbeiten ... 1906. 2. Band. Braunschweig. 1907. xiv, 176 p. f°.

Raulin, V.

Observations pluviométriques faites dans la France méridionale (sud-ouest, centre et sud-est) de 1704 à 1870... Paris. 1876. ix, 1044 p. 8°.

Observations pluviométriques faites dans la France septentrionale (est, Neustrie et Bretagne) de 1688 à 1870... Paris. 1881. xv, 810 p. 8°.

Thomson, J. J.

The corpuscular theory of matter. London. 1907. vi, 172 p. 8°.

RECENT PAPERS BEARING ON METEOROLOGY.

H. H. KIMBALL, Librarian.

The subjoined titles have been selected from the contents of the periodicals and serials recently received in the Library of the Weather Bureau. The titles selected are of papers or other communications bearing on meteorology or cognate branches of science. This is not a complete index of the meteorological contents of all the journals from which it has been compiled; it shows only the articles that appear to the compiler likely to be of particular interest in connection with the work of the Weather Bureau. Unsigned articles are indicated by a —

American aeronaut and aerostatist. St. Louis. v. 1.

Steichmann, H. Hildebrandt's Icelandic observations. (Oct., 1907.) p. 23-24.

Rotch, A. Lawrence. Use of registration balloons in obtaining meteorological conditions at great heights. (Nov.-Dec., 1907.) p. 17-18.

American geographical society. Bulletin. New York. v. 39. Dec., 1907.

Ward, R. DeC. Jamaica negroes and climate. [Note.] p. 744.

Ward, R. DeC. Weather and railroads. p. 717-748.

Electrical world. New York. v. 50. Dec. 21, 1907.

Carpenter, D. S. The rolling of thunder. p. 1211-1213.

Geographical teacher. London. v. 4. 1907.

Shaw, W[illiam] N[apier]. The general circulation of the atmosphere. [Popular presentation of the subject in the light of recent theories.] p. 52-64.

Great Britain. Meteorological office. Monthly meteorological charts. Indian ocean. Jan., 1908.

— Results of meteorological observations in the Persian Gulf and the Gulf of Oman. 1 p.

London, Edinburgh, and Dublin philosophical magazine. London. 6 series. v. 14. Dec., 1907.

Eve, A. S. On the amount of radium emanation in the atmosphere near the earth's surface. p. 724-733.

Poynting, J. H. On Professor Lowell's method for evaluating the surface temperatures of the planets, with an attempt to represent the effect of day and night on the temperature of the earth. p. 749-760.

Manchester geographical society. Journal. London. v. 23. Pt. 2. 1907.

Swallow, R. W. A glimpse at western China; the province of Shansi. [Including brief account of the climate, p. 57.] p. 49-59.

Science. New York. New series. v. 27. Jan. 10, 1908.

McNair, F. W. Report of the general secretary of the American association for the advancement of science for the Chicago meeting, convocation week, 1907-8. [Includes reports of the committee on seismology.] p. 41-49.

Reid, Harry Fielding. The meeting of the International seismological association. p. 74-76. [Includes reports of the committee on seismology.]

Scientific American supplement. New York. v. 65. Jan. 11, 1908.

Arrhenius, Svante. Auroras and magnetic storms. Caused by solar dust in the earth's atmosphere. p. 31.

Scottish geographical magazine. Edinburgh. v. 23. Dec., 1907.

Newbigen, Marion I. The study of the weather as a branch of nature knowledge. p. 627-648.

Scottish meteorological society. Journal. Edinburgh. v. 14. 3 ser. no. 24.

Mitchell, Arthur, and others. Memorial notices of Alexander Buchan. p. 101-118. [Includes portrait and list of writings.]

Bell, Herbert. Thunderstorms at the Ben Nevis observatories and on the Scottish coasts. p. 119-133.

Lempfert, R. G. K. The daily weather report. p. 134-140. [Description of British and foreign daily weather maps.]

Richardson, Ralph. Rain-producing east winds and their influence on the summer of 1907. p. 141-143.

Symons's meteorological magazine. London. v. 42. Dec., 1907.

Ellis, William. Greenwich air temperature. p. 209-214.

Aérophile. Paris. 15 année. Déc., 1907.

Aubry, Roger. L'auréole des aéronautes. p. 338. [Describes aureole observed around the shadow of a balloon on a cloud.]

Ciel et terre. Bruxelles. 28 année. 1 déc. 1907.

Vincent, J. Le grain du 3 août 1905. p. 445-450.

— Dispersion du brouillard et des fumées par l'électricité. p. 489-491.

Vincent, J. Le ballon-sonde belge du 25 juillet 1907. p. 495-500. [Account of the highest ascent ever made with sounding-balloon. Remarks on temperature inversion.]

France. Académie des sciences. Comptes rendus. Paris. Tome 145.

Demoussy, E. Influence de l'état hygrométrique de l'air sur la conservation des graines. p. 1194-1196. (Dec. 9, 1907.)

Nodon, Albert. Recherches sur les variations du potentiel terrestre. p. 1370-1371. (Dec. 23, 1907.) [Variations in earth potential as prognostics of atmospheric and seismic disturbances.]

Journal de physique. Paris. 4 série. Tome 6. Déc. 1907.

Schuster, Arthur. Sur quelques phénomènes électriques de l'atmosphère et leurs relations avec l'activité solaire. p. 937-950.

Mogimont. Publications populaires de la Station météorologique Mons. no. 5.

Bracke, A. La prévision locale du temps. Le polymètre Lambrecht. p. 123-132.

Le Paige, L. A propos de l'incendie d'Anvers. p. 135-137.

Nature. Paris. 36 année. 4 jan. 1908.

— Janssen. p. 78-79.

Société belge d'astronomie. Bruxelles. 12 année. Nov., 1907.

Arctowski, Henryk. Variations de longue durée de divers phénomènes atmosphériques. p. 328-340.

Agamennone, G. Théorie des tremblements de terre. p. 340-345.

Lagrange, E. La propagation des ondes sismiques longues. p. 347-348.

D., A. La méthode du "vent normal" dans la prévision du temps. p. 366-367.

Société météorologique de France. Annuaire. Paris. Oct., 1907.

Brunhes, B. Sur l'enregistrement des courants telluriques au Puy-de-Dôme et la perturbation magnétique du 9 au 10 février 1907. p. 181-182.

Marchand, E. Observations du courant tellurique sur la ligne télégraphique de l'Observatoire du Pic du Midi. p. 183-186.

Moureaux, Th. Nouvelles déterminations magnétiques dans la région du bassin de Paris. p. 188-195.

Société avarienne d'amateurs des sciences naturelles. Bulletin. Ekaterinburg. Tome 26. 1907.

Abels, H[ermann Fedorovic]. Précipitations atmosphériques dans le gouvernement de Perm pendant l'année 1903, 1904, 1905. p. 51-62.

Königliche preussische Akademie der Wissenschaften. Sitzungsberichte. Berlin. 1907. 50.

Zimmermann, H. Ueber grosse Schwingungen im widerstehenden